

Arrhythmias

ACUTE IDENTIFICATION OF GAPS IN ATRIAL RADIOFREQUENCY ABLATION LESION SETS USING MRI

ACC Oral Contributions

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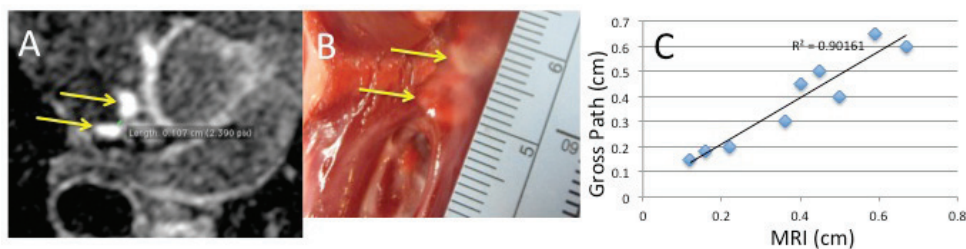
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Background: Radiofrequency ablation is routinely used to treat cardiac arrhythmias but the success in some of these procedures is limited by the presence of gaps in ablation lesion sets. Here we describe using MRI to acutely identify gaps in atrial ablation lesions.

Method: These studies were carried out in a pig model (n=5). Access to the right atrium was obtained through the femoral vein. A MRI compatible catheter was advanced (MRI Interventions, Irvine, CA) to the right atrium and discrete ablation lesions were made using 30 to 40 W for 30 - 60 secs. Ablation was carried out using real time catheter visualization provided by the Interactive Front End (IFE) software (Siemens, Princeton, NJ). After ablation, gadolinium was infused and delayed enhancement images were acquired with a 1 x 1 x 1.5 mm resolution. The gap between ablation lesions in MRI was measured using Osirix Imaging Software. The cardiac tissue was stained with 2,3,5-Triphenyl-2H-tetrazolium chloride (TTC) to delineate the ablation lesions. The gap length measured in the gross pathology specimen was correlated with the gap determined by MRI.

Results: Ablation lesions and the gap between them were clearly identified in MRI (A). The smallest gap that could be identified was 1.1 mm in length (A and B). The gap length determined using MRI correlated well with gap length measured in the gross pathology specimen with a correlation coefficient of 0.9 (C).

Conclusion: MRI can be used to acutely identify gaps in atrial ablation lesion sets in the millimeter range.



Panel A shows gadolinium delayed enhanced MR image showing the atrial ablation lesions (yellow arrow) and the gap in between. Panel B is the gross pathology specimen showing the ablation lesions (yellow arrow). Panel C shows the correlation between gap length between atrial ablation lesions determined in gross pathology versus MRI.